REMARKS

Claims 22, 27–29 and 140–144 are pending and under consideration in the instant application. With this amendment, Applicant respectfully requests consideration of amendments to claims 22, 140 and 144 presented herein.

Amendments to the Claims

Applicant amends claim 22 to move delete a reference to "reducing" a set of molecules, and to insert instead a reference to a "M-dimensional subspace". Support for these amendments can be found in the specification as filed at pages 40 and 43, as further discussed hereinbelow in connection with the Examiner's rejection of claim 22 under 35 U.S.C. § 112 (¶1). Applicant also amends the last step of claim 22 to relate the stored "representation" to the preamble of the claim.

Applicant amends claim 140 to delete a reference to "after said storing" and to replace it with "from said shape space". This amendment finds support in Applicant's specification at, e.g., pages 50–52.

Applicant also amends claim 144 to recite an apparatus including a computer program that implements the method of any one of claims 22, 27–29, and 140–143. Support for this amendment can be found in the specification as filed, at page 11, lines 28 – 31.

No new matter is believed introduced by these amendments, and entry thereof is respectfully requested.

Comments on Examiner's Characterization of Interview Summary

Applicant thanks the Examiner for providing a description of the telephonic interview with Applicant's representatives, held August 20, 2004. The Examiner has disagreed with Applicant's description of part of this interview, in which Applicant reported that a suggestion to amend claim 22 to recite a final step of "comparing a test molecule with a calculated shape space" was offered by the Office. Instead, the Examiner suggests that the offer involved testing of a test molecule via a physical assay.

Applicant has no specific recollection of a "physical assay" having been discussed during the interview. Furthermore, Applicant has reviewed notes taken during the interview and, likewise, sees no reference to a "physical assay" contained therein.

Nevertheless, Applicant takes the position herein that it seems possible that the form of the Office's suggestion to amend claim 22 was somehow misinterpreted during the course of the interview, and thanks the Examiner for clarifying the Office's position in this regard.

REJECTIONS OF THE CLAIMS

Rejections under 35 U.S.C. § 112 (¶ 1)

The Examiner has rejected claims 22, 27–29 and 140–144 under 35 U.S.C. § 112 (first paragraph) for allegedly failing to comply with the written description requirement because, in the Examiner's view, new matter has purportedly been introduced by way of Amendment filed, September 20, 2004. In each case, the Examiner alleges that support for the claim language in question cannot be found in the respective portions of the specification referenced by Applicant in remarks accompanying that Amendment. In view of this, Applicant takes this opportunity to fully explain the basis of the support for the claim language, as further discussed hereinbelow. Accordingly, Applicant respectfully submits that the various claims, as presented herein, fully comply with the statutory written description requirement.

Claim 22

In respect of claim 22, the Examiner has objected to the language at lines 17–18 wherein the "determining" involves "reducing [the] set of N molecules to M+1 molecules." With the instant amendment, Applicant has deleted the wording from the referenced step, and introduced the wording "such that said M-dimensional subspace is formed from M+1 molecules" into the subsequent "defining" step.

Support for the language introduced herein is provided by the principle that, as stated in the specification at page 42, lines 20–21: "[i]n M dimensional shape space one needs M+1 distances." This means that, as explained on page 43, a space of M dimensions requires M+1 points to define the position of another point within it, that position being defined by its distance from each of the other M+1 points. (Thus, to locate a point in 2 dimensions — as in a plane — one needs the distances from the point to 3 other points, and to locate a point in 3 dimensions, one needs 4 distances).

In the instant claim, a shape space of dimension M is being computed. (See also, *e.g.*, specification at page 40, lines 6–10.) Accordingly, by the foregoing principle, this space must be defined by M+1 molecules. That the shape space is defined by M+1 molecules is referenced at page 44 of the specification, at lines 5–6, in the context of calculating the distance of a molecule from other molecules in the database, having calculated its position in shape space ("... other than the M+1 used to find its shape space position").

Note also that, at line 7 of page 40, it is stated that $M \leq N-1$. In other words, $M+1 \leq N$, which is consistent with the overall procedure that the shape space is defined by $M+1$ molecules — a number that is less than or equal to the number (N) in the original set molecules.

Accordingly, Applicant respectfully submits that the specification as filed provides explicit support for the recited claim limitation, that the M-dimensional shape space is defined by $M+1$ molecules, and respectfully requests that the rejection be withdrawn.

Claim 29

The Examiner has rejected claim 29 for reciting a database that is "used by a pharmaceutical company." In particular, the Examiner considers that the reference to "[p]harmaceutical companies" on page 2 of the specification as filed is not specific to the instant invention. Applicant respectfully disagrees because the totality of the instant disclosure provides direct support for the recited claim limitation.

Applicant reminds the Examiner that compliance with the written description requirement of 35 U.S.C. § 112 is a question of fact, to be resolved on a case-by-case basis. *Vas-Cath, Inc. v. Mahurkar*, 935 F.2d at 1563, 19 USPQ2d at 1116 (Fed. Cir. 1991). Furthermore, "[t]here is no *in haec verba* requirement. Newly added claim limitations must be supported in the specification through express, implicit, or inherent disclosure." MPEP § 2163, Part I, Subpart B. Applicant respectfully submits that the instant specification provides express, implicit, and inherent support for the claim that Applicant's invention is to be performed by a database "used by a pharmaceutical company," for the following reasons.

The "Field of the Invention" section of Applicant's specification states that "[t]his invention *** is especially useful in comparing individual molecules against a large library of molecules and *has particular application in the pharmaceutical industry* in drug development." (emphasis added). Thus the specification provides explicit support that the invention is to be practiced within the pharmaceutical industry.

In Applicant's specification at page 2, lines 8 – 16, it is stated that:

> [p]harmaceutical companies maintain computer databases of all molecules they have synthesized, plus other compounds available on the market. The use of these databases and the techniques of computer-aided drug design are beginning to replace trial and error lab testing in new drug development.

Thus, one of ordinary skill in the art reading Applicant's disclosure appreciates explicitly that pharmaceutical companies have databases of molecules and that they use them for drug design.

At page 11, lines 5–6, of Applicant's specification, in the section entitled "Summary of the Invention", it is stated that "[t]he most immediate application of these techniques is to *pharmaceutical drug discovery and design*." (emphasis added) The "techniques" referenced in this passage on page 11 include generating "a high-dimensional shape space description of the molecules" (page 10, lines 20–21). Thus it is apparent that the instant specification also explicitly describes application of the claimed methods to pharmaceutical drug discovery.

In summary, the instant specification clearly states both that the claimed methods are directed to problems of "pharmaceutical drug discovery", and that they are for use "in the pharmaceutical industry." The instant specification further references the fact that, as would be well-known to one of ordinary skill in the art, computer databases are maintained by pharmaceutical companies for the purpose of drug discovery. One of ordinary skill in the art would thus appreciate, implicitly, that Applicant's claimed invention can be practiced by a pharmaceutical company using a computer database and, accordingly, that claim 29 is supported by the specification as filed. Accordingly, Applicant respectfully requests that the rejection of record be removed.

Claim 140

The Examiner has rejected claim 140 for the language that recites "constructing of a M-dimensional tree after storing." The Examiner states that he has not found support in Applicant's specification for the specific order in which the tree is constructed after storing. Applicant respectfully disagrees with the Examiner's reasoning.

As described on page 50 of Applicant's specification, under the heading "1) Constructing and using an M-dimensional tree", the first step is to "[f]ind the shape space positions for a set of N structures." The subsequent steps ((ii) – (v)) describe the ensuing construction and use of the M-dimensional tree. Thus, the calculation of the tree is clearly shown to be occurring *after* the calculation of the shape space. Since the shape space is used in calculating the tree it must, implicitly, have been stored previously.

Nevertheless, in an effort to speed prosecution, Applicant has amended claim 140 herein to delete the language "after storing" and, instead, introduces the language "from said

shape space." This recitation is also supported by the specification as filed at pages 50–52 under the description of "Using The Shape Space Positions to Organize A Database Of Molecules." Accordingly, claim 140 as amended herein, is properly supported by the specification as filed and Applicant respectfully requests that the rejection of record be removed.

Claim 142

The Examiner has rejected claim 142 because, in the Examiner's view, Applicant's specification does not support the storing of three dimensional information for molecules "prior to" calculation of a distance matrix. Again, Applicant respectfully disagrees.

The portion of the specification referenced by Applicant states that "the molecular field information is stored in a computer database." It can be seen from Applicant's specification at page 2, lines 18–28, that "three dimensional information of molecules" can be represented as a "field", *e.g.*, a steric field. Thus, the field information that Applicant describes as being stored in a computer database is, indeed, "three dimensional information." That this information can be stored "prior to" calculation of a distance matrix is evidenced from Applicant's "Summary of the Invention" section, at page 10, lines 16–21: "[t]he minimal distance between two molecular fields is used as a shape-based metric ... and a high-dimensional shape space description of the molecules is generated." Since one step in calculating the shape space description is to calculate a distance matrix, the claimed ordering wherein the three dimensional information is stored prior to such calculation is fully supported by the specification as filed.

Further demonstration of this point can also be seen, as follows. On page 24 of the specification as filed, it is stated that "these values [molecular overlaps] can be pre-calculated, stored along with other quantities ..., and used to speed the search for the best overlap." This demonstrates an embodiment in which the three-dimensional information for molecules is stored before it is used in subsequent analytical steps such as calculating a best overlap. It can further be seen that, in the description of "[d]etermining the shape space of a set of molecules" on page 38 (line 25, and following), a first step is to "[c]alculate the maximal overlap". This is carried out prior to subsequent steps, including a distance matrix calculation, in (b), on page 39.

Accordingly, claim 142 is properly supported by the specification as filed, and Applicant respectfully requests that the rejection of record be removed.

In summary, Applicant respectfully submits that claims 22, 27–29 and 140–144, as amended herein, are properly supported by the specification as filed and kindly asks the Examiner to remove the rejection of record.

Rejections of the Claims Under 35 U.S.C. § 101

The Examiner has rejected claims 22, 27 – 29, and 140 – 144 under 35 U.S.C. § 101 for allegedly being directed to non-statutory subject matter. Applicant respectfully traverses the rejection.

Applicant's claimed invention recites a "method of constructing a representation of a set of molecules stored in a computer database for facilitating searching thereof." The Examiner has alleged that such a method "is directed to non-statutory subject matter without requiring performance of a result outside of a computer or representing some type of *physical transformation* which is concrete or tangible" (emphasis added), citing to MPEP § 2106 IV B for support of this viewpoint. In response, Applicant first disagrees that the instant claims fail to produce a concrete or tangible result according to the controlling legal definition of such a result. Second, Applicant respectfully points out that the Examiner's determination to find a "physical transformation" as a requirement for allowable subject matter has no authority in the law and is therefore misplaced.

Applicant's claimed process has practical application

First, although the Examiner has drawn from the "Guidelines for Computer-Related Inventions" in the MPEP to frame his rejection, he is respectfully reminded that these Guidelines are, by their own characterization, not the law in the area of processes performed on a computer. (See, *e.g.*, MPEP § 2106 I "[t]hese Guidelines do not constitute substantive rule-making and hence do not have the force and effect of law.") On the contrary, the law in this area is controlled by *AT&T Corp. v. Excel Communications, Inc.*, 172 F.3d 1352, 50 USPQ2d 1447 (Fed. Cir. 1999), as well as by the earlier decision in *State Street Bank & Trust Co. v. Signature Financial Group, Inc.* 149 F.3d 1368 (Fed. Cir. 1998) referenced by Applicant in previous communications. From these authorities, it has emerged that the legal standard for patentability of a computer-based process is that it has a practical application.

In *AT&T*, the Federal Circuit upheld the validity of the inquiry — previously announced in *In re Alappat* — as to whether the

> claimed subject matter as a whole is a disembodied mathematical concept representing nothing more than a 'law of nature' or an 'abstract idea,' or if the mathematical concept has been reduced to some practical application rendering it 'useful.' In *Alappat*, we held that more than an abstract idea was claimed because the claimed invention as a whole was directed toward forming a specific machine that produced the useful, concrete, and tangible result of a smooth waveform display.

AT&T at 1357 (citations omitted). It is also to be noted that "the scope of § 101 [is] the same regardless of the form — machine or process — in which a particular claim is drafted." *AT&T* at 1357.

Thus, *AT&T* affirms the patentability of "a mathematical algorithm, [that] may be an integral part of patentable subject matter such as a machine or process if the claimed invention as a whole is applied in a 'useful' manner." *AT&T* at 1358.

In the instant claims, Applicant's method is directed to facilitating a search of a database of molecular data. As evidenced by Applicant's specification, this task is not divorced from practical application. Pharmaceutical companies utilize databases of molecules in drug-related development and research (see, *e.g.*, specification at page 2, lines 8 – 10). Searches of such databases have hitherto been difficult to formulate and have been exceedingly time-consuming. Applicant's claimed method offers the useful result that such searching can be efficiently carried out (see, *e.g.*, specification at page 25, lines 26 – 28), and that molecules within a company's own inventory, or otherwise commercially available, can be effectively located.

Accordingly, because, after *AT&T*, it suffices that the claimed method represents the practical application of an algorithm to useful effect ("our inquiry here focuses on whether the mathematical algorithm is applied *in a practical manner to produce a useful result*." (emphasis added) *AT&T* at 1360), and because Applicant's claims are clearly directed to a useful effect, Applicant's claims constitute patentable subject material.

Furthermore, the holding in *AT&T* of course builds upon the decision in *State Street Bank*: "to be patentable an algorithm must be applied in a 'useful' way." *Id.* at 1373. Since the Examiner is meticulous in looking to the MPEP for support of his position, Applicant respectfully draws his attention to the MPEP's own discussion of *State Street Bank*:

> The claimed invention as a whole must accomplish a practical application *** Accordingly, a complete disclosure should

contain some indication of the practical application of the
claimed invention, *i.e.*, why the applicant believes the claimed
invention is useful. *** The applicant is in the best position to
explain why an invention is believed useful. Office personnel
should therefore focus their efforts on pointing out statements
made in the specification that identify all practical applications
for the invention. Office personnel should rely on such
statements throughout the examination when assessing the
invention for compliance with all statutory criteria.

MPEP § 2106 II. A. Since Applicant has identified a practical application of the claimed

invention, and by inference the Examiner admitted as much during the telephonic interview

with Applicant's representatives, August 20, 2004, (in answer to a request from Applicant's

representative to clarify the nature of the instant rejection, the Examiner stated that he was

issuing a "lack of statutory subject matter" rejection, and not a "lack of utility" rejection)

Applicant cannot see how the rejection can still be sustained.

Applicant's claimed process is useful, concrete, and tangible

The practical application of a claimed process may be demonstrated by showing that

it produces a "useful, concrete, and tangible result." (See, *e.g.*, *AT&T* at 1358.) The

Examiner has interpreted such a result as involving "at least some physicality of result, or

representation of a *physical transformation* as required for statutory subject matter"

(December 17, 2004 Office Action, at page 5, emphasis added.) Applicant respectfully

disagrees with this interpretation. For guidance on interpreting the terms "useful, concrete,

and tangible", we can look to both *AT&T* and *State Street Bank*.

In *AT&T*, the claim was to a "process that uses the Boolean principle in order to

determine the value of the PIC [Primary Inter-exchange Carrier] indicator" used in

telecommunications. *AT&T* at 1358. The court found that "[t]he PIC indicator represents

information about the call recipient's PIC, a useful, non-abstract result that facilitates

differential billing of long-distance calls made by an IXC's subscriber." *Id.* at 1358. Thus, in

AT&T, the claimed process uses a mathematical algorithm to produce a numerical result that

can be used in a practical manner – in telephony — and it is the practical application to

produce a useful result that confers patentability, not an attendant physical transformation.

The *AT&T* court also referenced the technology in *State Street Bank*: "the processing

system there was patentable subject matter because the system takes data representing

discrete dollar amounts through a series of mathematical calculations to determine a final

share price — a useful, concrete, and tangible result." *AT&T* at 1358. Thus, in *State Street*

Bank also, a useful, concrete, and tangible result is found because the mathematical steps are

applied to numerical quantities (including a share price) that are recognized in commerce, not because there is any associated physical transformation.

Similarly, Applicant's claims harness a mathematical algorithm to produce a representation of stored molecular data that facilitates searching. Such an application also clearly produces a useful, concrete, and tangible result, within the terms of the law, because the data that is being manipulated corresponds to physical quantities (molecular structural data) that have independent meaning outside of the computer, and because the end result of the process is a transformed set of molecular data that renders search and retrieval — practical activities carried out by scientists — highly efficient.

The Examiner has also stated that the "combination of a useful, concrete, and tangible result" may form the basis of a rejection "if only one or more of these criteria fail to be met in the claimed subject matter." Applicant respectfully disagrees with this reading of the law. Nowhere in either *AT&T* or *State Street Bank* are the terms 'concrete', 'useful', or 'tangible' separately applied, or given separate meaning. The focus in each of these cases is not upon specific interpretations of these words but upon the claimed subject matter as a whole. That is, the focus is always on whether the claimed subject matter produces a result or effect that has application and meaning beyond a mere abstraction.

It is also significant that the court in *AT&T* affirmed the patentability of mathematical algorithms performed on a computer that "produce a useful concrete, tangible result *without pre-empting other uses of the mathematical principle.*" (emphasis added). *AT&T* at 1358. The court in *AT&T* was careful to distinguish between useful applications of mathematical algorithms, which are patentable, from abstract statements of those algorithms, which, if patentable, would preclude the application of such algorithms in other areas of commerce and technology. It is clear that Applicant's instant claims fall into the former category, a useful application of a mathematical algorithm, and not the latter. Applicant's claims clearly would not pre-empt the application of shape space calculation, distance matrix calculation, or matrix diagonalization, in other spheres of endeavor.

Patentability may not be predicated on a requirement of a physical transformation

Not only is the Examiner wrong to interpret the term "tangible, useful, and concrete" as requiring a physical transformation, *AT&T* also disposes of the Examiner's belief that an underlying "physical transformation" is a pre-requisite to patentability:

> The notion of 'physical transformation' can be misunderstood.
> In the first place, it is not an invariable requirement, but merely
> one example of how a mathematical algorithm may bring about

> a useful application. As the Supreme Court itself noted, "when [a claimed invention] is performing a function which the patent laws were designed to protect (*e.g.*, transforming or reducing an article to a different state or thing), then the claim satisfies the requirements of § 101." *Diehr*, 450 U.S. at 192, 101 S.Ct. 1048 (emphasis added). The '*e.g.*' signal denotes an example, not an exclusive requirement.

AT&T at 1358–1359. Thus, in *AT&T*, the Court has addressed the term "physical transformation", which originates in *Diehr* 450 U.S. at 184, 101 S.Ct. 1048, and stated explicitly that it is not a pre-requisite to patentability of a computer-related invention.

In particular, according to *AT&T*, "the mere fact that a claimed invention involves inputting numbers, calculating numbers, outputting numbers, and storing numbers, in and of itself, would not render it non-statutory subject matter, unless, of course, its operation does not produce a 'useful, concrete and tangible result.'" *Id.* at 1359, citing to *State Street Bank.* Thus, the patentability inquiry always reverts to the nature of the application of the claimed process, and not to how it is achieved.

In respect of Applicant's claimed invention, the Examiner dismisses the phrase "stored in a computer database" of Applicant's claim 22 as being in the preamble, rather than being in a "method step". Applicant sees no merit to this distinction. Indeed, in *AT&T*, no such distinction was germane to patentability. In *AT&T*, for example, the only reference to a "telecommunications system" in patentee's claim 1 was to be found in the preamble, and not in any subsequent method steps, all of which recite mathematical operations. Applicant again respectfully points out to the Examiner that patentee's claim 1 in *AT&T* was held to recite statutory subject matter, regardless of any distinction between preamble and body of the claim.

In summary, whether or not Applicant's claimed invention brings about a physical transformation does not settle the question of whether it represents statutory subject matter. Specifically, the Examiner's reading of the terms "concrete, tangible, and useful" as requiring a physical transformation is simply not the law. Applicant reminds the Examiner again that the "inquiry here focuses on whether the mathematical algorithm is applied in a practical manner to produce a useful result" *AT&T* at 1360, and not whether it involves a physical transformation.

The Examiner's interpretation of the Examination Framework for Computer-related Inventions is incorrect

The Examiner responded to Applicant's discussion of a flow-chart ("Examination Procedures for Computer-related Inventions", at http://www.uspto.gov/web/offices/pac/dapp/pdf/flow.pdf) by disagreeing with Applicant's interpretation of routes to statutory subject matter from and including Box 12. Applicant respectfully points out that the Examiner's interpretation of this flow-chart is informed by his mistaken belief that patentability is predicated on a physical transformation.

Specifically, the option in box 12 that references "[m]anipulat[ing] data representing physical objects or activities to achieve a practical application" clearly characterizes Applicant's invention, which recites manipulations of data representing molecular structures (*i.e.*, physical objects). The Examiner has, however, introduced the requirement that the practical application "represents a physical transformation". As discussed hereinabove, this requirement is improper.

The Examiner's analysis of Box 13 follows similar reasoning and may be discounted on the same grounds.

The Examiner's application of the decision in State Street Bank is incorrect

Applicant has presented the holding and salient facts of the decision in *State Street Bank* in remarks mailed March 10, 2003, and September 20, 2004. The Examiner has declined to accept Applicant's view that the holding in *State Street* supports the patentability of the instant claims. In response, Applicant respectfully submits that the patentability of Applicant's claims is fully consistent with the facts and holding of both *State Street Bank* and *AT&T* (discussed hereinabove), and disagrees with the Examiner for the following reasons.

The Examiner attempts to distinguish *State Street Bank* from Applicant's claims based on their respective fact patterns:

> the fact pattern in *State Street*...differs from the instant claims in controlling monetary transfer, a physical transformation of money, in contrast to the molecular modeling of the instant claims which lack any such transfer of material as well as lacking even the representation of a physical transformation.

December 17, 2004 Office Action, at page 8. First, as discussed hereinabove, the requirement of a physical transformation is not currently the law. Second, is the Examiner saying that the numerical representation of financial data in a computer system is itself a "representation of a physical transformation"? The vast majority of financial transactions within banking systems involve no "transfer" of paper money (or coins or bills) at all, which

is precisely the scenario that the claimed method in *State Street Bank* was addressing. On the other hand, is the Examiner suggesting that molecules themselves are not physical objects? If not, just what precisely are we, and the world around us, composed of?

The Examiner goes on to suggest that no manipulation of data within databases, as recited in Applicant's claims, is "related to any physical transformation or representation thereof that is concrete and tangible." December 17, 2004 Office Action, at page 9. Applicant respectfully refers the Examiner to remarks hereinabove concerning the meaning of 'concrete and tangible' as applied to a claimed computer-based process. Additionally, Applicant respectfully points out again that there is no requirement of a 'physical transformation' for such a claim to be to statutory subject matter.

Additionally, the Examiner states that "[t]here are no 'real world impact' limitations in any of the instant claims." (December 17, 2004 Office Action, at page 9.) If, by ' real world impact' the Examiner means a physical transformation, then the law does not require it. Notwithstanding this, since applicant's claims recite "molecules stored in a computer database", this itself grounds the claimed method firmly in the 'real world' where the claimed algorithm is applied in a concrete, useful and tangible way to representations of physical objects (molecules). Applicant respectfully reminds the Examiner that the Federal Circuit in *State Street Bank* explicitly held that it is "the transformation of *data*, representing discrete dollar amounts ... [that] constitutes a practical application of a mathematical algorithm." (Emphasis added) *Id.* at 1373. Again, Applicant asks the Examiner to address precisely how the transformation of monetary data in a computer differs from the transformation of molecular data in a computer.

Finally, in comparing the 'storing' step of Applicant's claim 22 with the 'storing' step (g) of the claim in *State Street Bank*, the Examiner states that since the data being manipulated in *State Street* "clearly represents various types of monetary (a physical material) movement such as expenses, etc." it contrasts with forming a "representation of a set of molecules." Again, this ignores the reality that, on the one hand, the technology in *State Street Bank* has been designed to handle precisely the sort of transaction that *has no physical counterpart*, for example a wire transfer that shows up only as an entry in a statement, where there has been no physical transfer of bills, notes, or coins whatsoever and, thus, has no attendant 'physical transformation'. On the other hand, the Examiner's analysis is inconsistent with the stark reality that, if numerical monetary data does have a physical counterpart in instruments such as bills, notes, or coins, then molecular data stored in a computer has an equally real counterpart in the actual material molecules themselves that

make up the substances that are stored in company warehouses, used in synthesis in laboratories, and form the basis of medications.

Since the Examiner is unpersuaded that the holding in *State Street Bank* supports Applicant's position, Applicant also takes this opportunity to present the facts of the decision in *AT&T v. Excel* in order to illustrate still other examples of patentable subject matter.

As previously discussed herein, according to *AT&T*, a mathematical algorithm is patentable subject matter to the extent that it produces a "useful, concrete, or tangible result". In deciding the patentability of the claimed invention in *AT&T*, the Federal Circuit concluded that an algorithm for use in telecommunications did indeed produce such a result. In the claim, the method "generates a message record for an interexchange call" using a specific algorithm. In the algorithm, an indicator, whose value is determined by a Boolean principle, was used to determine the rate at which a long-distance telephone is charged, depending upon which exchange carrier the call is routed over. The court noted that, in accordance with one of its earlier decisions, "[t]hat the product is numerical is not a criterion of whether the claim is directed to statutory subject matter." *Id.* at 1358.

In particular, Applicant respectfully points out that the claim in *AT&T* was for an automated method that did not require the act of placing a telephone call, or routing a telephone call. The claim merely recited "generating a message record for an inter-exchange call" and thus was purely numerical in both its action and result. This is significant because it shows that the "physical transformation" or the "real world impact" that the Examiner seeks to find in the claim itself is illusory at best. The practical application upon which the patentability of the *AT&T* claim is founded is that the computed steps may be used within the telecommunications industry. In particular, the calculated quantity has meaning when ascertaining the appropriate carrier to charge when connecting a long-distance telephone call. The claim itself did not recite any steps attendant to routing calls or identifying a carrier.

Similarly, in Applicant's instant claims, the useful result is that of having constructed a representation of molecular data that makes searching more efficient, the practical application is to searching industrial databases, and the data itself has a meaning outside that of the claimed steps.

Summary

The essence of the Examiner's rejection of the instant claims is as follows: first that "the instant claims are [in the Examiner's view] directed to non-statutory subject matter without requiring performance of a result outside of a computer or representing some type of physical transformation which is concrete or tangible," citing to MPEP § 2106 IV.B for

support. Second, that where the presence of statutory subject matter relies upon "manipulating physical objects or activities to achieve a practical application", that practical application "requires the production of a useful, concrete, and tangible result." MPEP § 2106 IV.B.2. As discussed hereinabove, Applicant respectfully disagrees with the Examiner's interpretation of these requirements.

According to current law, when establishing whether or not a computer-related invention constitutes patentable subject matter, "the focus is understood to be not on whether there is a mathematical algorithm at work, but on whether the algorithm-containing invention, as a whole produces a tangible, useful, result." *AT&T* at 1361.

As discussed herein, Applicant's invention has a practical application and produces a concrete, tangible, and useful result, according to the law. Therefore, Applicant's invention constitutes patentable subject matter and, accordingly, Applicant respectfully requests that the rejection of record be removed.

Rejections of Claim 144 under 35 U.S.C. §§ 102(b) and 102(e)(2)

The Examiner has rejected claim 144 as being anticipated by U.S. patent no. 5,187,796, to Wang, *et al.* Applicant respectfully traverses the rejection because claim 144, as amended herein, recites an apparatus "including a computer program that implements the method of any one of claims 22, 27–29, and 140–143." Since Wang does not teach Applicant's claimed methods, as recited in claims 22, 27–29, and 140–143, and since Wang does not, correspondingly, teach a computing apparatus that includes a computer program that implements any of Applicant's claimed methods, Wang does not anticipate claim 144.

Accordingly, Applicant respectfully requests that the rejection of record be removed.
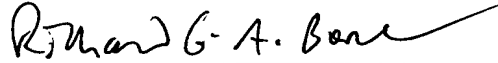
CONCLUSION

In view of the remarks presented hereinabove, Applicant respectfully submits that the subject application is in good and proper order for allowance. Withdrawal of the Examiner's rejections and early notification to this effect are earnestly solicited. If, in the opinion of the Examiner, a telephone conference would expedite the prosecution of the subject application, the Examiner is encouraged to call the undersigned at (650) 843-4000.

[SIGNATURE BLOCK AND FEE AUTHORIZATION ON NEXT SHEET]

No fee is believed owing with this response. However, should the Commissioner determine otherwise, he is authorized to charge any underpayment or credit any overpayment to Morgan, Lewis & Bockius LLP Deposit Account No. 50-0310 (ref. 61191-0003-US) for the appropriate amount. A copy of this sheet is attached.

Respectfully submitted,

Date: March 17, 2005

Richard G. A. Bone
Limited Recognition under 37 C.F.R. § 11.9(b)
(Copy of Certificate attached hereto)

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